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Tidal observations in the Arctic regions have a value not only in extending our knowledge of the geographic distribution of the tides but also in helping to throw light on the theory of the existence of a large land mass in the Arctic, a deduction which was arrived at from scanty tidal observations.

The paper gives a concise report of the methods and results of tidal observations at ten places in the general region of Beaufort Sea, where tidal observations at best are meager, and is a welcome addition to the tidal literature of the Arctic. An appendix gives mean ranges and establishments and a map of the region showing the location of the tide gauges.

The report brings out the importance of accurate time for proper comparisons with other stations and in this respect will be valuable for the Arctic explorer, whose tidal observations are only incidental to the many varied subjects to which he must give attention. It is shown that, on account of the small range of the Arctic tides, observations should be made when possible at the time of spring tides and further that, with regard to general procedure in any future tidal observations in the Arctic regions, some permanent tidal station should be established for reference in the region and should be maintained during the time the explorations are in progress.

G. T. RUDE

TOPOGRAPHIC DETERMINANTS OF ARTILLERY OPERATIONS

W. C. CLARK, compiler. **Heavy (Coast) Artillery: Orientation.** Revised. xv and 302 pp.; maps, diags., ills., bibliogr. Coast Artillery School, Fort Monroe, Va. 75 cents. 9 x 6 inches.

Batteries of heavy artillery are usually located several miles behind an army's front line and direct their fire at targets which are not visible from the gun positions. Under these conditions the fire must be controlled by precise topographic methods and based on accurate, large-scale topographic maps. The procedure of making the topographic determinations necessary for map firing is called *orientation*; and the present work on heavy artillery orientation was compiled by Major Clark as a textbook for use in the Coast Artillery School at Fort Monroe, Virginia, and in universities giving preliminary military training.

The representation of relief by the contour method, map scales and slope scales, the drawing of profiles, and the use of conventional signs are briefly but very effectively discussed. In a large measure the treatment is based on experience gained on the western front during the World War. Measurements are given in the metric system, and French maps and French methods receive special consideration. The use and care of surveying instruments and the construction and use of maps are explained in detail, this part of the work comprising nearly two-thirds of the total. The remaining chapters deal with problems falling particularly within the province of the artillery officer.

The text, which is based on articles contributed by instructors on the staff of the Coast Artillery School, is clearly written and well illustrated and will come measurably near achieving the purposes set forth at the close of the introduction, among which are the two following: "To give in a clear and concise form all the information necessary either for an orientation or a battery officer to solve the various problems of orientation that may arise in connection with a battery of heavy artillery executing map firing" and "to present the subject matter in a manner that will be intelligible to an officer who has had no training in civil engineering."

DOUGLAS JOHNSON

RECENT BOOKS ON MAPPING AND SURVEYING

J. K. FINCH. **Topographic Maps and Sketch Mapping.** xi and 175 pp.; maps, diags., ills., bibliogr., index. John Wiley & Sons, Inc., New York, 1920. 9 x 6 inches.

W. L. WEBB and J. C. L. FISH. **Technic of Surveying Instruments and Methods.** xvi and 319 pp.; diags., ill. John Wiley & Sons, Inc., New York, 1917. \$2.00. 6¾ x 4 inches.

C. B. BENSON. **Map Reading for Aviators, with a Chapter on Aerial Navigation.** 56 pp.; diags., ills. Edwin N. Appleton, Inc., New York, 1918. \$1.00. 7 x 5 inches.

The keynote of "Topographic Maps and Sketch Mapping" is its directness and clarity of presentation. For this reason it should prove especially valuable for the introduction of the

subject to beginners. It assumes that the student has had no preliminary preparation and teaches him how to read a map from its purely mechanical standpoint. No attempt is made at map interpretation. The geological structure controlling the topographic features is ignored.

The second and third parts of the book are devoted to the preparing of simple sketch maps in the field and to landscape sketching. The methods are simple but effective, making available for the use of the layman methods which are used in a more elaborate way by the civil engineer himself. A useful appendix prepared by Mr. F. K. Morris contains a descriptive list of the principal topographic maps of the world.

"Technic of Surveying Instruments and Methods" presents a series of exercises and problems covering the whole field of surveying. It is "not intended to replace any general textbook on surveying, but to supplement the general directions of such a book by detailed directions for specific operations in field and office." It provides definite problems for drilling the student in the use of instruments and explains topographic and railroad surveys by describing the organization, equipment, and personnel of the parties and then in detail the various phases of the work. To the reviewer it seems that a little more instruction might have been given with regard to the plane table, in spite of the fact that reference is made to D. B. Wainwright's "Plane Table Manual" (Appendix 7, U. S. Coast and Geodetic Survey Rept. 1905). In common with most books and texts on surveying it fails to present the methods so nicely developed by the U. S. Geological Survey in this line.

"Map Reading for Aviators" is a pocket-sized booklet which aims to give the main elements of map reading. Map scales, conventional signs, contours and hachures, orientation are taken up briefly but clearly. The explanation of contours is aided by some especially good drawings. Several problems are given, together with the correct solutions, on the determination of speed of flight, correction for wind, and the use of the compass in the air.

A. K. LOBECK

REGIONAL BIBLIOGRAPHIES OF GEOLOGY AND PHYSICAL GEOGRAPHY

W. F. FERRIER AND D. J. FERRIER. **Annotated Catalogue of and Guide to the Publications of the Geological Survey of Canada, 1845-1917.** 544 pp.; maps, index. Geological Survey of Canada, Dept. of Mines, Ottawa, 1920. 10 x 6½ inches.

Changes in system and form of publication since the inception of the Canadian Geological Survey render particularly valuable this analysis of its publications. Separate sections deal with the various types of reports, memoirs, bulletins, guidebooks, etc. A section entitled "Finding Lists" and accompanied by a series of index maps gives a regional bibliography, the arrangement being under provinces and territories. There is also a list according to authors, and an appendix gives a partial list of papers by members of the Survey staff published elsewhere but distributed by the Survey and in some instances still available.

J. BRÜGGEN. **Bibliografía minera i jeológica de Chile.** 142 pp.; indexes. Soc. Nacional de Minería, Santiago de Chile, 1919. 10 x 7 inches.

The titles included in this bibliography are classified by author under the sections (1) metalliferous deposits; (2) coal and petroleum; (3) salts, including nitrates, other fertilizers, sulphur, building stone; (4) mineralogy and petrography; (5) volcanism and mineral waters; (6) general geography; (7) geology; (8) paleontology. There is an index to each section. In view of Montessus de Ballore's exhaustive bibliography of Chilean earthquakes (*Rev. Chilena de Hist. y Jeogr.*, Vols. 18 and 19, 1916) references to this phase of volcanism are omitted from section 5. The section on geography is likewise short on account of the well-known bibliography "Ensayo de una bibliografía histórica i jeográfica de Chile," by N. Anrique and L. I. Silva. This, however, was published in 1901; and the present bibliography includes very few recent publications under the heading of geography.

Indice geográfico de las publicaciones del Instituto Geológico (1873-1919). *Bol. Inst. Geol. de España*, Vol. 40 (Vol. 20, 2nd Ser.), 1919, pp. 5-120. Madrid.